

**TREE INVENTORY AND ASSESSMENT REPORT**  
**City of Santa Barbara Parks Division**  
**September 2010**

## **I. INTRODUCTION**

In 2007, the City of Santa Barbara Parks and Recreation Department Forestry Program implemented two complementary projects, the Street Tree and Park Tree Inventory and iTree Assessment. The Street Tree and Park Tree Inventory was a complete site-by-site city-wide inventory initiated in May 2007 and finalized in December of that year. The goal of the inventory project was to update information about the City's urban forest to:

- Provide accurate tree information for planning work to be conducted by the Urban Forestry Program;
- Provide information on exactly where each specific tree is located because it may be the only species in the area;
- Assist with horticultural heritage in Santa Barbara and the City's commitment to community forestry; and
- Provide for electronic maintenance of data.

In March, 2008, the City received grant funding from the California Department of Forestry and Fire Protection (CalFire) to: 1) implement a focused inventory of ten percent of the Street Tree Inventory using the iTree management and assessment tool STRATUM (Street Tree Resource Assessment Tool for Urban forest Managers) (August 2008); and 2) develop outreach and education materials that include four self-guided tree tour maps, a community guide to tree species and expansion of the City's website to include these educational materials as well as key features from the inventory.

The iTree study works to assess the structure and function of a ten percent sample of Santa Barbara's street trees and quantify the dollar value of annual environmental and aesthetic benefits: energy conservation, air quality improvement, CO<sub>2</sub> reduction, stormwater control, and property value increase. Data collection was finalized in April 2008. Analysis of the data did not follow until late 2009 due to the state freeze on grants in response to the budget shortfall. With authorization to move forward, the development of the education and outreach materials is currently moving forward with an anticipated end date of December 2010.

Together, these Projects create a comprehensive inventory of Santa Barbara's public urban forest resources. The data received from the Street and Park Tree Inventory act as a management tool on a per tree site basis; iTree data allows users to speculate about what future trends are likely and what management challenges will need to be met to achieve urban forest sustainability. Understanding the resource will allow the City to effectively manage the resource, develop policies, and set priorities including:

- Development of an urban forest management plan;
- Scheduling annual tree planting and pruning programs;
- Assist with protecting and enhancing Santa Barbara's horticultural heritage and the City's commitment to community forestry;

- Provide information for assessment of the value of the City's urban forest for energy conservation, water quality, air quality, wildlife habitat and property values;
- Illustrating the need for ongoing funding to protect and maintain the urban forest;
- Development of community education and outreach materials; and
- Ensuring the City of Santa Barbara remains eligible for recognition as a Tree City USA.

The following sections describe the methodology, analyze and interpret the results, and make recommendations to achieve the goals set forth in the scope of each project and included in this document.

## **II. METHODOLOGY**

### **2.1 Street Tree and Park Tree Inventory**

In May 2007, West Coast Arborist, Inc. (WCA) was contracted to perform the street tree and park tree inventory. WCA inventoried approximately 35,000 tree sites in the City. This included sites where current trees exist and sites where opportunities exist to plant more trees. The inventory also included 9,300 trees in City parks and facilities.

The inventory was complete in December 2007. WCA, Inc. field technicians collected data using a handheld computer and a GPS receiver. Coordinates were taken at the base of each tree, or the closest location possible to receive satellite transmission.

Data collected was transferred to an internet driven program called Arbor Access. WCA customized the program to meet the Forestry Program's specific needs. Arbor Access allows staff to store, retrieve, update, delete, and add tree records and work histories.

Each tree or vacant site includes all of the following information:

- District (Grid Areas)
- Address, or a range of them
- Tree number (1, 2, 3...at a given address)
- Street name
- Location in relation to the property (i.e. Front, Side, or in a Park)
- Species
- DBH by ranges
- Height by ranges
- Planting space size
- Whether overhead utilities exist
- Maintenance needs at the time of data collection
- Other necessary attributes

Arbor Access is used daily and has proven to be a useful database and management tool. It is used by Forestry staff to create work orders for individual tree maintenance, to build

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maintenance work lists for field staff and contractors, research previous work records, and verify tree information. The database is updated whenever there is a change to a tree including, pruning, planting, and removal.

## 2.2 iTree Assessment

To conduct a focused assessment on Santa Barbara's street trees, the City used the USDA Forest Service, PSW Research Station software suite STRATUM. While STRATUM allows for full or sample schemes, for the purposes of this study, a sample inventory was selected.

Using ArcView GIS and the City's Centerline data, a ten percent simple random sample of street segments was generated and produced a total of 350 street segments for inventory. Street segments are defined as a portion of street from one intersection to the next and on only one side. Tree information collected from the Street and Park Tree Inventory was overlaid onto the selected 350 street segments. This was used for cross-referencing and QA/QC. Every city quadrant containing selected street segments was printed for field use.

Beginning in September 2008, data was collected using a Portable Handheld Device (PDA) that was preformatted to a STRATUM-compatible data file. Information gathered was directly transmitted from the PDA to the Desktop Computer, reducing the amount of direct data input and human error. The STRATUM program requires specific types and amounts of data to accurately project the structure, function, value, and management needs of the street tree resource. Among the information required are:

1. **Tree Identification** - a number assigned to each tree to count them.
  2. **Zone** - an alphanumeric code or name that represents the management area or zone that the tree is located in within a particular city. Santa Barbara has eight zones, some of which are separated into sub-zones.
  3. **City Managed** – this study looked only at City owned trees.
  4. **Street Segment**- a numeric code to identify the street segment within the city where the tree is located.
  5. **Species Code**- an alphanumeric code consisting of the first two letters of the genus name and the first two letters of the species.
  6. **Land Use**- a numeric code to describe the type of area where the tree is growing. The default values are as follows:
    - 1 = Single-family residential
    - 2 = Multi-family residential (duplex, apartments, condos)
    - 3 = Industrial/large commercial
    - 4 = Park/vacant/other (agricultural, riparian areas, greenbelts, park, etc.)
    - 5 = Small commercial (minimart, retail boutiques, etc.)
  7. **Location of Site** - a numeric code to describe the kind of site where the tree is growing. The default values are as follows:
    - 1 = Front yard
    - 2 = Planting strip
    - 3 = Cutout (tree root growth restricted on all four sides by hardscape within dripline)
    - 4 = Median
    - 5 = other maintained locations
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- 6 = other un-maintained locations
8. **Diameter at Breast Height** - (DBH measured in inches)
  9. **Sidewalk Damage**- a numeric code to describe the amount of sidewalk damage. The default values are as follows:
    - 1 = None – sidewalk heaved less than  $\frac{3}{4}$  inch, requiring no remediation.
    - 2 = Low – sidewalk heaved  $\frac{3}{4}$  to  $1\frac{1}{2}$  inches, requiring minor grinding or ramping.
    - 3 = Medium – sidewalk heaved  $1\frac{1}{2}$  to 3 inches, requiring grinding or ramping and/or replacement.
    - 4 = High – sidewalk heaved more than 3 inches, requiring complete removal and replacement.
  10. **Wire Conflict** - a numeric code to describe utility lines that interfere with or are present above a tree. The default values are as follows:
    - 1 = No lines – no utility lines within vicinity of tree crown
    - 2 = Present and not conflicting – utility lines occur within vicinity of tree crown, but crown does not presently intersect wires.
    - 3 = Present and conflicting – utility lines occur and intersect with tree crown.
  11. **Condition of Wood**- a numeric code to describe the health of the tree's wood (its structural health) as per adaptation of the Council of Tree and Landscape Appraisers (CTLA) tree appraisal standards (CTLA, 2000. Guide for Plant Appraisal, 9th Ed. Savoy, IL: ISA, 143 pp). The default values are as follows:
    - 1 = Dead or Dying - extreme problems
    - 2 = Poor - major problems
    - 3 = Fair - minor problems
    - 4 = Good - no apparent problems
  12. **Condition of Leaves**- a numeric code for the health of the tree's leaves (its functional health) as per adaptation of CTLA tree appraisal (CTLA, 2000. Guide for Plant Appraisal, 9th Ed. Savoy, IL: ISA, 143 pp):
    - 1 = Dead or dying - extreme problems
    - 2 = Poor - major problems
    - 3 = Fair - minor problems
    - 4 = Good - no apparent problems

### III. RESULTS

#### 3.1 Street Tree and Park Tree Inventory

A total of 36,657 street tree sites were inventoried. Of these, 33,193 are actual trees, 3,372 are vacant sites, and 92 are stumps. Sixty (60) parks and public facilities were also surveyed (Table 1). Time and budget limitations led to eight (8) parks being partially surveyed (Table 2), and six (6) open space parks not surveyed (Table 3).

Santa Barbara has 456 different species of trees, the majority of which are found within City parks. The Coast Live Oak is the most abundant tree numbering 4,198. The next three most commonly seen species are the Jacaranda, Mexican Fan Palm and Queen Palm. One hundred and ninety-six (196) different species were represented five (5) or less times, eighty-eight (88) of those occur only once.

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**Table 1. Tree Numbers at Fully Surveyed Parks/Facilities**

<b>Park/Facility</b>	<b>Number of Trees</b>
Alameda (East and West)	299
Alice Keck Park Memorial Garden	206
Ambassador	20
Bohnett	131
Cabrillo Ballfield	43
Cabrillo Pavillian Bathhouse	199
Chase Palm	932
City Hall/ De La Guerra Plaza	36
Community Development Dept	77
Dwight Murphy Ballfield	110
East Beach	30
Eastside Community Center	6
Eastside Library	29
Eastside Neighborhood	37
Escondido	36
Franceschi	322
Hale	345
Hilda Ray	18
La Mesa	136
Leadbetter	229
Los Banos Del Mar Pool	112
Los Robles	23
Mackenzie	199
Main Library	86
Moreton Bay Fig Park	12
Municipal Tennis Center	96
Oak Park	809
Orpet (Upper and Lower)	241
Ortega Park	65
Parque De Los Ninos	25
Pershing	33
Pilgram Terrace	58
Plaza del Mar	73
Plaza Vera Cruz	44
Police Department	4
San Roque	12
Shoreline	132
Skaters Point	102
Skofield	934
Spencer Adams/Louise Lowrey	39
Sunflower	21
Sylvan	49

Thousand Steps	2
Visitor Information Parking Lot	153
Waterfront Area	374
Willowglen	90
<b>Total</b>	<b>7,029</b>

**Table 2. Numbers of Trees at Partially Surveyed Parks/Facilities**

<b>Park/Facility</b>	<b>Number of Trees</b>
Andree Clark Bird Refuge	156
Dougless Family Preserve	762
Hidden Valley	218
Honda Valley	346
Las Positas Tennis Courts	56
Mission Park	187
Stevens	185
Upper Stevens	112
<b>Total</b>	<b>2,032</b>

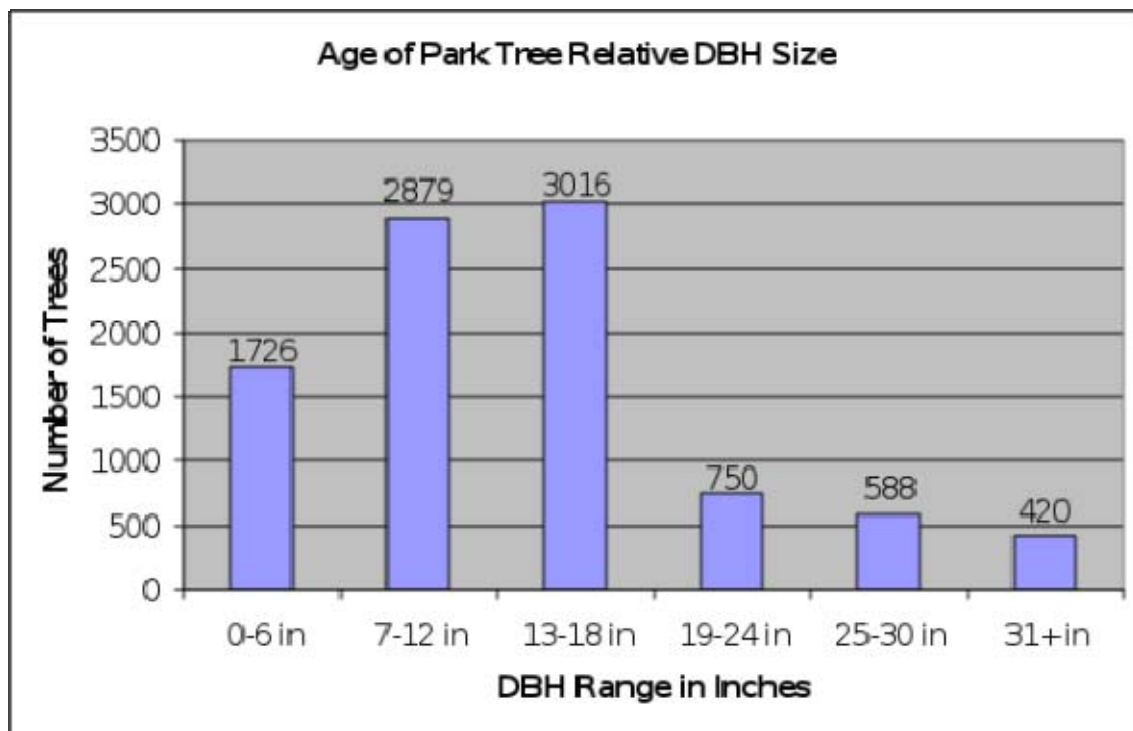
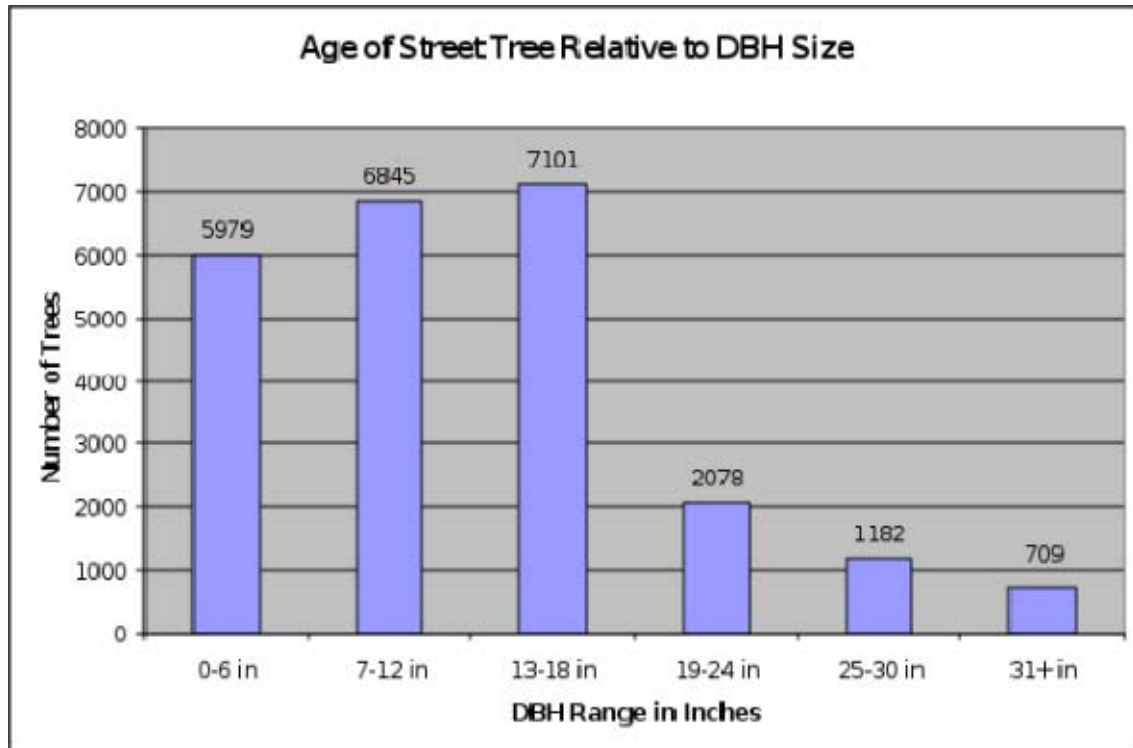
**Table 3. Parks/Facilities Not Surveyed**

Carrillo Recreation Center*
Equestrian Circle
Gould
Laurel Canyon
Parma
Rattlesnake

\* Site not included in the Park Tree Inventory. City staff determined there to be approximately 10 trees on site and this number is included in the total number of Park/Facility trees.

### *Tree Age*

Both park and street trees follow a similar trend falling off when reaching 19 in. dbh and greater, as is seen in the graphs below. Park trees tend to be of similar age because the majority of the trees were planted at the time the park was created.



### *Infrastructure Conflicts*

Conflicts with urban infrastructure include limited plantable space and interference to overhead/underground utilities. Plantable space along parkways is generally limited to a four-foot area. Trees planted prior to sidewalk installation and trees not suitable for the area can cause damage to the surrounding infrastructure. City-wide, 5,160 trees have overhead utilities. Of these, 558 are large trees (>25 dbh). The presence of overhead utilities does not automatically imply additional maintenance, but gives the City information regarding the number of trees with the potential to cause conflicts.

### *Maintenance Needs*

Maintenance needs, if any, were identified for each tree site. In general, three types of maintenance are needed: planting, removal of dead or dying trees, and grid trim. The inventory identified 3,372 tree sites available for planting. The City's Forestry Program currently plants twice as many trees as the average loss (150), equating to approximately 300 trees a year. Additionally, the program goal is to trim 5,100 street trees and 480 park and facility trees annually. Maintaining these goals will require consistent and sufficient funding.

## 3.2 iTree Assessment

STRATUM analyzes the structure and related benefits and costs of a sample of the street tree resource. Three kinds of Benefit–Cost Analyses and fourteen kinds of Resource Structural Analyses were conducted.

### *Species Distribution*

A total of 4,991 trees and 705 unplanted tree sites were assessed. In general, Santa Barbara's streets are comprised of approximately 25% deciduous trees, 53% evergreen, and 22% palm trees. Table 4, *Species Distribution*, shows the percentage of the ten most prevalent trees found in this study.

<b>Table 4. Species Distribution (%)</b>	
<b>Species</b>	<b>Percent (%)</b>
Jacaranda	14.06
Queen Palm	9.42
King Palm	4.76
Mexican Fan Palm	4.48
Fern Pine	4.45
Evergreen Pear	3.27
Weeping Bottlebrush	2.47
Southern Magnolia	2.38
Coastal Live Oak; California Live Oak	2.32
Brisbane Box	2.32
Other	50.08
<b>Total</b>	<b>100.00</b>



### *Tree Age*

Tree age, relative to DBH size class, was defined for each tree. Approximately 51.4% are classified as young (<12 dbh) trees and 48.5% are mature (>12 dbh). This being said, the majority (55.85%) of Santa Barbara's street trees range 6 to 18 dbh. Age of trees may be skewed. The STRATUM program does not take into account the particular growth of palm trees. Palm trees make up a fourth of the inventory and do not follow the same growth pattern as coniferous or deciduous trees. Instead palms attain their girth early in life and do not generally get larger as they grow older. Table 5, *Relative Age Distribution*, shows that Santa Barbara has a healthy mixture of young, middle, and old trees.

<b>Table 5. Relative Age Distribution (%)</b>								
<b>DBH Class (in)</b>								
<b>0-3</b>	<b>3-6</b>	<b>6-12</b>	<b>12-18</b>	<b>18-24</b>	<b>24-30</b>	<b>30-36</b>	<b>36-42</b>	<b>&gt;42</b>
10.47	11.18	29.78	26.07	12.97	5.28	2.50	0.74	0.99

### *Street Tree Canopy Cover*

Street tree canopy cover is defined as the percent of street and sidewalk area covered by trees. Tree cover is important in assessing the urban forest because it is directly related to environmental quality. Maintaining robust tree cover decreases the need and costs associated with managing air and water quality. It also provides a benchmark for setting urban forest canopy goals.

The City of Santa Barbara has 220 miles of streets, has an average street width of 40 feet and sidewalk width of 5 feet. Out of a total of 12,160 acres of land (19 sq. miles), Santa Barbara has approximately 1,333 acres of streets and sidewalks and 253 acres of street tree canopy cover. This equates to a 19.22 percent canopy cover over the City's streets and sidewalks.

### *Ecosystem Benefits*

STRATUM quantifies the ecosystem benefits of energy conservation, stormwater reduction, carbon dioxide reduction, air quality improvement, and aesthetics. Table 6, *Annual Benefits for Santa Barbara's Street Trees*, summarizes these services and their associated dollar value.

Annual benefits total nearly \$3.1 million and average \$93 per tree. In Fiscal Year 2010, the City spent approximately \$952K (\$28/tree) maintaining its public street trees leaving \$2.14 million in net annual benefits to the community. For every \$1 spent on tree care, street trees are providing \$2.14 in benefits. When compared to other cities that have completed a STRATUM analysis in the last 10 years<sup>1</sup>, Santa Barbara's benefit-cost ratio of 2.14 is similar to Cheyenne, WY (2.09) and Fort Collins, CO (2.18), higher than those reported for Albuquerque, NM (1.31), Berkeley, CA (1.37), Boise, ID (1.30), Charleston, SC (1.35), and Santa Monica, CA (1.61), but is below those reported for Bismarck, ND (3.09) and Boulder, CO (3.64).

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<sup>1</sup> Benefit-cost ratio is a product of the environmental benefits minus the costs associated with managing the resource and is influenced by the type and number of trees a city has in its inventory. For this reason the comparison was limited to ten cities nationwide that have completed a STRATUM analysis within the last 10 years and managed roughly 15K-45K trees.

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### *Energy Savings*

Tree canopy cover provides shade to built surfaces and reduces the need to heat and cool buildings and homes. Street trees contribute indirectly to energy savings by creating an overall cooling of the surrounding environment, while trees on private property provide direct shade to homes and buildings. While this study did not note the trees proximity to buildings, the potential electrical and gas energy savings is \$227,040 or \$6.84 per tree. The total tree canopy cover for the ten percent sample was approximately 1.7 million square feet.

### *Air Quality*

STRATUM analyses carbon dioxide (CO<sub>2</sub>) reduction as the sum of decreased atmospheric CO<sub>2</sub> due to sequestration by trees and reduced emissions from power plants due to reduced energy use. The model also accounts for CO<sub>2</sub> released as trees die and decompose and CO<sub>2</sub> released during the care and maintenance of trees. The annual dollar savings totals \$33,857 for the sample, or \$1.02 per tree. Similarly, air quality is the sum of air pollutants [ozone(O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter (PM<sub>10</sub>)] deposited on tree surfaces and reduced emissions from power plants (NO<sub>2</sub>, PM<sub>10</sub>, VOCs, SO<sub>2</sub>) due to reduced electricity use (measured in pounds/tree/year). The model accounts for potential negative effects of trees on air quality due to Biogenic Volatile Organic Compounds (BVOC) emissions. Air quality benefits total \$509,844 annually or \$15.36 per tree.

<b>Table 6. Annual Benefits for Santa Barbara's Street Trees (\$)</b>		
<b>Ecosystem Service</b>	<b>Total Annual Dollar Value</b>	<b>Value Per Tree</b>
Energy Conservation	\$227,040	6.84
CO <sub>2</sub> reduction	\$33,857	1.02
Stormwater reduction	\$29,874	0.90
Air Quality Improvement	\$509,844	15.36
Aesthetics	\$2,293,304	69.09
<b>Total Annual Benefits</b>	<b>\$3,093,919</b>	<b>\$93.21</b>
<b>Annual Maintenance/Planting Budget (FY 09)</b>	<b>\$ 952,000</b>	
<b>Net Annual Benefit</b>	<b>\$2,141,919</b>	

Not all trees benefit the environment equally, and therefore do not provide the same financial value. For example, bottlebrush trees are a small tree that provide minimal shading and contribute \$23 per tree in annual benefits to Santa Barbara. Palm trees make up an estimated 22% of Santa Barbara's street tree population and average \$35 per tree in annual benefits.

The tree with the highest financial value is the redflower gum, providing \$388 in benefits annually. The coast live oak, southern magnolia, camphor tree, Chinese elm, cajeput tree, canary island pine and Victorian box all provide annual benefits that exceed \$150 per tree.

Understanding the environmental benefits and financial value of each species is important for both private residents and for the City in its long-term planning for the urban forest.

### *Infrastructure Conflicts*

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Data was collected for the presence of overhead utility and sidewalk heave conflicts. Overhead utility conflicts were put into one of three categories: low voltage line present with no conflict, low voltage line present with a conflict, and high voltage line present. Trees having conflicts with low voltage lines numbered 538, while trees with high voltage lines overhead numbered 1,045. Four-hundred and seventy-six (476) trees had overhead low voltage lines, but were not conflicting, and the remaining 2,931 trees had no overhead lines. Overhead utility line conflicts are city-wide and not specific to any section of the City. Additionally, no species of tree was found to significantly increase the chance of creating conflicts with overhead utilities.

Sidewalk heave conflicts were measured as low (0-1 in.), medium (1-2 in.) and high (>2 in.). Of the 4,991 trees assessed for sidewalk heave conflicts, 783 were low, 239 were medium and 43 were high. Trees associated with having high conflicts were the Jacaranda (6), Fern pine (3), Southern magnolia (3), Sweetgum (5), Camphor tree (3), Black oak (3), Cajeput tree (6), Victorian box (2) and all other trees (12).

#### *Relative Performance Index*

Another way of assessing the importance of a species is running a Relative Performance Index (RPI). Index values relate each species overall condition to all other species in the city. Species with an average condition compared to all other species have an RPI value of 1. Any value higher than 1 indicates species with above-average condition ratings. Likewise, index values lower than 1 are species with below-average condition ratings when compared with other inventoried street trees. The vast majority of Santa Barbara's street trees have RPI values greater than 1, indicating a healthy species complex. Those that do not, may have been poorly maintained, were planted at locations not suitable for the species, or are beginning to reach the end of their useful life as street trees. A deeper look at RPI values and those species falling below 1 may be a way of determining if certain species should be replanted.

The following section will further discuss the ways in which Santa Barbara can use the information collected from the Projects to better articulate and manage its urban forest system.

## **IV. DISCUSSION**

The Street Tree and Park Tree Inventory and iTree study communicate the value of the urban forest and illustrate the need for ongoing preservation. It identifies the current state or condition of the resource and highlights the challenges and opportunities for future management. Santa Barbara has a diverse, healthy, and rich urban forest with significant ecosystem services and environmental benefits. With well over 50,000 street and park trees, Santa Barbara has the potential to use this resource to increase the sustainability of built environments and save money.

The value of Santa Barbara's urban forest resides in eight categories:

- **Horticultural Heritage** – Since the 1800's, conservators and horticulturists have adorned Santa Barbara's landscape with a variety of trees, shrubs, and other plants. The efforts of plantsmen like Joseph Sexton, Francesco Franceschi, A. Boyd Doremus, and E.O. Orpet are seen in our parks and neighborhoods and are enjoyed and appreciated daily. Maintaining this legacy is to preserve the cultural and historical record each tree
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has, as well as act as a conservatory for the display of exotic, rare and even endangered species.

- **Energy Savings** – Strategic planting of trees that shade paved surfaces and near buildings will prolong the life of asphalt and reduce fossil fuel use. Trees reduce energy consumption by direct and indirect cooling. Shade reduces the amount of heat built-surfaces absorb and results in a reduced use of air-conditioning. Additionally, during the evapotranspiration process, trees cool the air by expending solar energy that would otherwise result in heating the air.
- **Air Quality** – Leaves filter the air we breathe by removing dust and other particulates. They absorb carbon dioxide, ozone, carbon monoxide, and sulfur dioxide, and give off oxygen. The larger the tree leaf cover, the greater the potential to improve our air quality.
- **Water Quality** – Stormwater runoff is the single largest source of water pollution in the City (SWMP, 2009). Trees offset the amount of stormwater runoff in a multitude of ways. They capture rainwater and remove impurities, reduce volume into sewer systems, and reduce peak stream flows. Canopy cover helps reduce erosion by reducing the impact of raindrops on bare ground.
- **Property Value Increase** – Studies show trees increase real estate value anywhere from 1-10% depending on type and size. As trees mature, so too do their dollar value.
- **Parks and Open Space** – Because Santa Barbara is primarily a residential community with high tourist activity; we recognize the importance of a strong park system. Trees are a major component to this system, providing shade, reducing wind, and increasing the overall aesthetics.
- **Quality of Life** – A less tangible aspect of study is the increased quality of life due to a green environment. Numerous studies report trees attribute to overall increased health, increased work productivity, and reduced aggressive driving (US Forest Service). It is recognized in Santa Barbara's General Plan that it is essential to protect our community's natural resources: clean air, uncontaminated beaches, scenic views, and it's cultural and historical background; and to preserve the ecological balance of all life systems with which we coexist.
- **Wildlife Habitat** – Urban trees offer habitat to birds, insects, reptiles, mammals, and the vast system of microorganisms in the soil. Without stands of trees, animals like the Monarch butterfly would not survive their year-long migration. Willows on creek and river banks provide just the habitat needed for the endangered songbird, least Bell's vireo. Trees also provide habitat and shade in the creek corridors for fish and amphibian species.

### *Maintaining Diversity*

Santa Barbara has one of the most diverse urban forests in California (Muller and Bornstein 2010) with over 450 different species, yet we stand to lose this diversity without proper management. Historical records indicate a decline in species over the past 30 years. With over three decades of inventories, earlier editions of *Trees of Santa Barbara* list species and varieties numbering 550 or more. Today, the City has lost nearly 100 species to development, drought,

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and disease. The inventory found nearly 200 species occurring five or less times, 88 of which were represented only once. This fact, coupled with the narrowing of the approved planting list, suggests Santa Barbara's tree diversity is at risk.

Yet, increasing diversity through parkway and private plantings is a challenge. Trees providing higher than average environmental and economic benefits may not be suitable for planting near built infrastructure, buildings or homes. iTree results found that mature sweetgum, southern magnolias, fern pines, and cajeput trees all ranked high in terms of economic and environmental benefits due to their large tree crown, yet also had higher than average conflicts with sidewalks.

### *Street Trees*

A number of issues threaten the viability of Santa Barbara's street trees. In the downtown core and other commercial zones, small tree pits and failure to maintain tree grates or prune surface roots can cause root/trunk girdling, shortening the tree's lifespan. Soil compaction also stresses trees and damage their roots and trunks. Throughout the early 1900's, in residential areas and along arterials many trees were planted in substandard planting strips and inappropriately under power lines. A number of these trees are now outgrowing their planting strip or tree pit. Those under wires have been repeatedly topped by Southern California Edison (SCE), which is no longer an acceptable management practice. Tree topping results in poorly attached quickly growing sprouts that require frequent pruning and weaken the tree structure. When street trees are removed, replacement may not be an option, due to incompatibility with current planting standards. Additionally, the costs to continually mitigate conflicts must be weighed against the costs of removing and replacing problematic trees.

Although large trees are a rather small part of Santa Barbara's total street tree population, people consider them highly important and resent the aesthetic impact of their loss. Outreach, public notification, and education provide information about why trees are being removed, but public response can be emotional and focused on saving individual trees regardless of their condition.

### *Private Trees*

The Forestry Division receives a host of calls from citizens both pro-tree and anti-tree. While most Santa Barbara residents value and enjoy trees, there are situations where trees are regarded as troublesome and either removed or topped (a very poor maintenance practice) for blocking views and sunlight or dropping leaves or fruit. While trees in business districts may be appreciated by shoppers, business owners may have concerns with their signs being visible and with maintenance. Trees in parking lots offer shade but may reduce the number of stalls. On institutional and industrial campuses trees soften buildings, absorb noise and dust, and provide outdoor space for employees and visitors to enjoy, but trees require an investment in maintenance.

Improper maintenance impairs tree health and shortens tree lifespan. Being the owner of healthy trees requires an investment in proper maintenance. Education is an ongoing process, but even for people who know how to prune, it is difficult and sometimes costly to prune mature trees that require climbing, large equipment, and specialized skills. These challenges have led to relatively poor tree maintenance practices on private property overall.

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### *Tree Removal*

As part of any comprehensive forest management plan, sometimes trees need to be removed. The conditions that require such action include hazard tree reduction, changes in facility use, new development, trees that have outgrown their space due to poor initial tree selection, tree decline due to age, and other similar reasons. The removal of trees can cause substantial community concern. Even the removal of trees at designated public viewpoints can be controversial. The City takes these community concerns quite seriously and seeks to do its best in demonstrating to the public sufficient justification for the removal of trees.

## **V. NEXT STEPS AND KEY QUESTIONS**

As the City moves forward with the development of an Urban Forest Management Plan, key questions will be how to:

- Maintain diversity
- Integrate landscape and built environment
- Manage established trees sensitive to the compaction and root disturbance
- Alleviate constrained settings like narrow planting strips, tree pits and grates
- Encourage planting and preservation of trees on private property when there are insufficient incentives and regulations
- Approach residents when there is a lack of broad-based community appreciation of the benefits of professional tree management
- Educate citizens on the understanding of proper tree care requirements and practices
- Manage the competition for space lost to development
- Achieve these objectives given the limited maintenance budget

This report along with outreach materials will support the City's work with private landowners in the selection and maintenance of trees, and foster educated management decisions about public trees. Formulating specific goals and setting policies about this resource in a management plan will solidify the argument that trees are essential to the City.

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